AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

	1. CONTRACT ID CODE J	PAGE OF PAGES 1 / 3

2. AMENDMENT/MODIFICATION NO. 0001	3. EFFECTIVE DATE 10-Mar-2004	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO.(If applicable)

6. ISSUED BY CODE	N00174	7. ADMINISTERED BY (If other than item 6) CODE	

NAVSEA INDIAN HEAD
101 STRAUSS AVE
ATTN: KAY PROCTOR 1141W
PROCTORKV@IH.NAVY.MIL
INDIAN HEAD MD 20640-5035

See Item 6

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		X	9A. AMENDMENT OF SOLICITATION NO. N00174-04-R-0025
		X	9B. DATED (SEE ITEM 11) 26-Feb-2004
			10A. MOD. OF CONTRACT/ORDER NO.
			10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer [ ] is extended, [X] is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods:
(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted;
or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE
RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN
REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter,
provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS.
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

SEE THE NEXT PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
	TEL: EMAIL:

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY	16C. DATE SIGNED 10-Mar-2004
(Signature of person authorized to sign)		(Signature of Contracting Officer)	

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

(End of Summary of Changes)

The following items are applicable to this modification:

THE ABOVE SOLICITATION IS AMEND TO ANSWER QUESTION RECEIVED TO DATE, AND REVISE THE REQUIREMENT SPECIFICATION.

1. REPLACE THE REQUIREMENT SPECIFICATION WITH ATTACHMENT (1)

2. BELOW ARE THE QUESTIONS AND ANSWERS RECEIVED TO DATE.

QUESITION:1)
 In paragraph 2.1.2, I don't understand the UUT Initialization Interface Hardware. Do we provide some sort of a spin-up mechanism inside the roll axis? DO we just provide electrical interface to the GFE mechanism? If so, what are the electrical wiring requirements(number of slipring lines, power requirements, etc)? If we are to provide some mechanism then what are the requirements? It might help if the Navy provided a sketch describing this hardware.

ANSWER 1) SEE ATTACHED DRAWING (PDF FILE)

QUESTION 2)
Section 2.1.3, 2.1.4 and 2.1.5 present different pitch and yaw axes requirements. Which is correct?

ASWER 2) SEE REVISED SPECIFICATION

QUESTION 3)
Sections 2.1.4 and 2.1.5 sets the requirements for axes acceleration and rate but also defines actuator size, axes inertia, pressure and flow rate. Do you mean to define both the performance requirements as well as design details?

ANSWER 3) SEE REVISED SPECIFICATION

QUESTION 4) The inertia of the UUT in section 2.1.1 is inconsistent with the load inertia in section 2.1.3 Which is correct?

ANSWER 4) SEE REVISED SPECIFICATION

QUESTION 5)
In regards to the options listed in reference to the RF and Infrared Compact Range, Can you please supply the specifications for the mentioned items. Also, the compact range can be offered for mounting to a Two-Axis Target Gimbal Set, bench or on a wall. Please provide the preferred mounting configuration. If you prefer a Target Gimbal Set to mount around the Three-Axis Missile Simulator, shall we provide a price for the optional Two-Axis Target Gimbal Set?

ANSWER 5) SEE ATTACHED DRAWING

QUESTION 6)

If we elect not to offer a price for the Compact Ranges, does it effect the weight/evaluation of our proposal in the selection process. Will Acutronic be considered a potential source for line item 1,2 and 3? We have worked with companies involved with the compact ranges (and can offer some sources) but the equipment was purchased directly by the procurer of the system. Acutronic at that point would work in conjunction with the compact range suppliers to ensure the IR/RF source will interface to the simulator

ANSWER 6) SEE ATTACHED DRAWING

2.   ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME.

3. DIRECT ANY QUESTIONS OR CONCERN (301) 744-6680.

Requirements Specification for
Three Axis Flight Motion Simulator (a.k.a. "Rate Table")

1.0   GENERAL DESCRIPTION

1.1   This specification shall establish the minimum performance, design, fabrication, and turnkey installation requirements for one (1) 3-axis motion simulator (roll, pitch, yaw) to be procured and installed at the U.S. Government's Allegany Ballistics Laboratory in Rocket Center, West Virginia.

1.2   The motion simulator will be used on two families of projectiles, smart gun rounds with the need for high speed roll and missiles with heavier UUTs, a standard inner roll axis, and higher inertial requirements. These requirements are listed as Roll B and Roll A respectively. It is envisioned to have two bolt-on inner roll axis assemblies to accommodate the different UUT requirements.

1.3   The motion simulator shall be of rugged and substantial construction so as to repeatedly perform extended hours of continuous operation.

1.4   This Flight Motion Simulator can be new or refurbished.

1.5   The equipment shall be delivered to Alliant Techsystems, Allegany Ballistics Laboratory, 210 State Route 956, Rocket Center, WV, FOB Destination.

1.6   Unless stated otherwise, requirements detailed herein shall be regarded as minimum performance requirements.

2.0   SYSTEM REQUIREMENTS

2.1   MECHANICAL SYSTEM

2.1.1   UUT – (Unit Under Test)

Diameter	5 to 17 inches
Length	10 to 30 inches
Axis Intersection*	8.50 inches
Weight	up to 45 kg (100 lbs)

2.1.2   UUT Initialization Interface Hardware

One articulating armature capable of hosting either an inductive interface or wired connector interface to a common mounting. This interface will initialize the flight guidance system inside the UUT. Prior to initialization, the armature shall firmly position the interface, then after initialization is complete should retract itself clear

of the flight motion machinery automatically before flight motion simulation begins. Basic features shall include:

Modularity: The armature shall terminate in a mounting capable of hosting either an electrical connector or inductive interface, each module for which shall be GFE, and not exceed 2.3 kg (5 lbs).

Wiring: The armature shall provide an open conduit for running initialization interface wiring without snags during simulation runs.

Controllability: The armature controls shall integrate with the main control system of the flight motion simulator. Control shall be selectable between manual and automatic. The user interface shall be at the Instrumentation Console.

2.1.3   Motion Simulator Roll (Inner) Axis

ROLL A

SPECIFICATION	Roll A Axis	Pitch Axis	Yaw Axis
Load Weight – 100 lb			
Load Inertia, in-lb-sec²	.88	40	40
Max. Acceleration, °/sec²	10,000	5,000	5,500
Max. Velocity, °/sec(RPM)	700	400	200

POSITION COMMAND, ANALOG

Displacement, degrees	±120	±45	±45
Freq. Resp, HZ (-90°Ø,1.0°pp)	30	10.5	11.5
Repeatability, deg. Max	±0.005	±0.005	±0.005
Drift, Max. (1 hour), deg	±0.005	±0.005	±0.005
Threshold, deg	0.0005	0.0005	0.0005
Position Accuracy, Max., deg	±0.053	±0.053	±0.053
Readout Accuracy, Max., deg	±0.053	±0.053	±0.053

Orthogonality of Axes - ±30 arc-sec
Intersection of Axes - ±0.5mm
Distance from axis intersection to rear or the load – 24 inches

VELOCITY COMMAND

Displacement, degrees	Continuous	---------	-------
Minimum Velocity,Rev/sec(RPM)	0.6(36)	---------	-------
Velocity Accuracy, %	±1	---------	-------
Freq. Response, Hz(-90°,36RPM/secpp)	10	---------	-------

Slip Ring Load Circuits (Minimum) – 100 @ 2 Amp rating
Noise – 20 milliohms/pair max (100mA current @ 200 RPM)
Dielectric Strength – 500VRMS

ROLL B

SPECIFICATION	Roll B Axis	Pitch Axis	Yaw Axis
Load Weight – 30.3 lb			
Load Inertia, in-lb-sec²	.45	25.1	25.1
Max. Acceleration, °/sec²	5,500	5,000	5,000
Max. Velocity, °/sec	21,600(3600)	400	200

POSITION COMMAND, ANALOG			
Displacement, degrees	±120	±45	±45
Freq. Resp, HZ (-90°Ø,1.0°pp)	30	10.5	11.5
Repeatability, deg. Max	±0.005	±0.005	±0.005
Drift, Max. (1 hour), deg	±0.005	±0.005	±0.005
Threshold, deg	0.0005	0.0005	0.0005
Position Accuracy, Max., deg	±0.053	±0.053	±0.053
Readout Accuracy, Max., deg	±0.053	±0.053	±0.053

VELOCITY COMMAND, ANALOG			
Displacement, degrees	Continuous	---------	-------
Minimum Velocity,Rev/sec(RPM)	0.6(36)	---------	-------
Velocity Accuracy, %	±1	---------	-------
Freq. Response, Hz(-90°,36RPM/secpp)	10	---------	-------

Slip Ring Load Circuits (Minimum) – 100 @ 2 Amp rating
Noise – 20 milliohms/pair max (100mA current @ 200 RPM)
Dielectric Strength – 500VRMS

2.1.4   Motion Simulator Yaw (Middle) Axis

Drive	Hydraulic actuator or electric
Angular Displacement	±45 degrees
Maximum Torque	3390 N-m (2,500 ft-lbs)
Differential Pressure	140 atm (2000 psid)
Maximum Acceleration	5,000 deg/sec^2 (175 rad/sec^2)
Maximum Velocity	200 deg/sec (3.5 rad/sec)

2.1.5   Motion Simulator Pitch (Outer) Axis

Drive	Dual-vane hydraulic actuator or electric
Angular Displacement	±45 degrees
Maximum Torque	17,700 N-m (13,000 ft-lbs)
Differential Pressure	140 atm (2000 psid)
Maximum Acceleration	10,000 deg/sec^2 (175 rad/sec^2)
Maximum Velocity	400 deg/sec (3.5 rad/sec)

2.2   ELECTRICAL SYSTEM

2.2.1   Facility Power Requirements

      Instrumentation Console   115 VAC, ±10%, single-phase
                                            50/60 Hz, 10A

      Hydraulic Power Supply   440 VAC, ±10%, 3-phase, 60 Hz,
                                            75A/phase (54 KVA), 150 A/phase
                                            in-rush

2.2.2   UUT Wires – Simulation Test/Telemetry Interfacing

Type of Cable	Number of Cables	Total Wires
Twisted shielded Pair, 24 AWG	8	16
Twisted pair, 24 AWG	8	16
Twisted pair, 22 AWG	4	8
Shielded wire, 24 AWG	12	12
Unshielded wire, 24 AWG	36	36
CUSTOMER LINES (each)		88

2.3   OPERATING ENVIRONMENT

      Temperature   75 degrees ±15 degrees F

      Maximum relative humidity   80% (non-condensing)

      Non-operating temperatures   -40 to +130 degrees F

2.4   COMPACT RANGE OPTIONS

The following options are for integration into the 3-axis flight motion simulator at a later date. Allowances should be made in the motion simulator design to accommodate these features as future upgrades, if not purchased with this specification.   A single construct capable of meeting both performance goals is preferred, however, each should bid separately unless the technological solution presented combines both.

2.4.1   Compact Infrared Range -– Shall be capable of presenting an infrared representation of between one and several targets along with their simulated surroundings. The IR image presented shall be viewable in visible spectra on the Instrumentation Console, and shall automatically update with respect to the flight motion simulation.

2.4.2   Compact RF Range -- Shall be capable of presenting a radio frequency representation (i.e., simulated seeker radar return) of between one and several targets along with their simulated surroundings. The signal distribution presented shall be viewable to a

human user on the Instrumentation Console, and shall automatically update with respect to the flight motion simulation.

3.0   AUTOMATION INTERFACES

The Instrumentation Console shall have the following automation interfaces for executing flight simulation motions:

3.1   SCRAMNet –– Reflective memory produced by Systran, Inc. (www.systran.com). Two single mode duplex fiberoptic cables are required to interface the Motion Simulator into a greater RDT&E suite.

3.2   Ethernet – 10/100 base T data port only, as a backup automation interface.

3.3   Software – For manual control override, flight motion simulation setup, and simulation control. A Graphical User Interface (GUI) common to a PC workstation is required, with its control memory interfaceable to SCRAMNet and Ethernet, in that order.

4.0   WARRANTY

6.1   All components shall be guaranteed, parts and labor, for a minimum of one (1) year from the date of operational acceptance at the ABL facility.